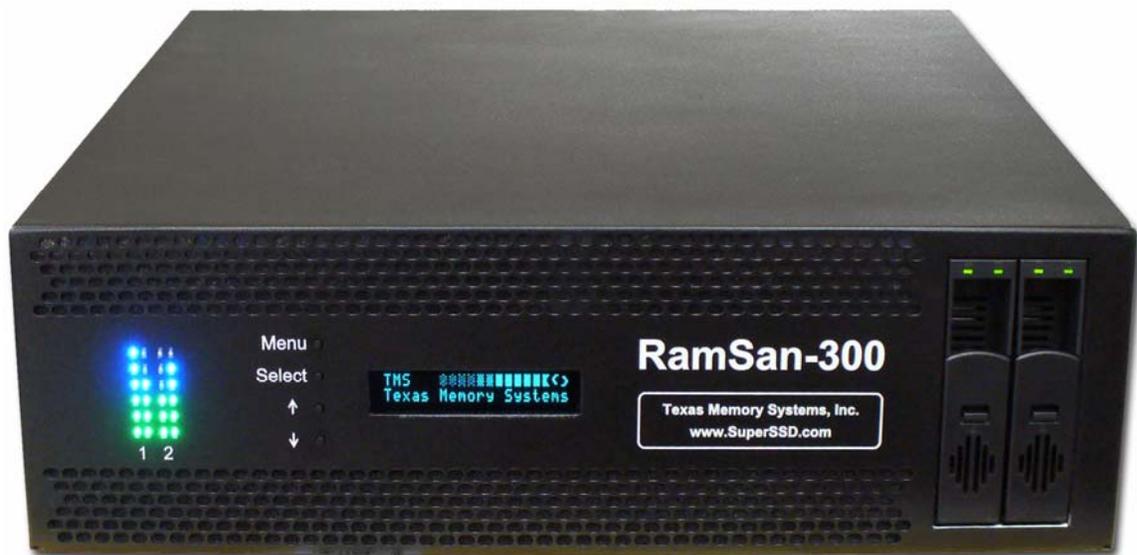


TEXAS MEMORY SYSTEMS, INC.

RamSan

Web Interface Guide



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Preface

Document Overview

This document provides operating procedures for the RamSan web management interface, which enables users to manage the system remotely through a Java interface.

Revision History

The following table describes revisions to this document:

| Version | Comments | Date | Firmware |
|----------------|-----------------|-------------|-----------------|
| 1.0 | Initial release | 10/11/2006 | 3.0 |

Chapter 1 – Introduction

1.1 Overview

The RamSan solid state disks use DDR RAM as their primary storage. This technology enables practically instantaneous data access, which results in dramatic application performance increases.

RamSan solid state disks are manageable from a remote web interface accessible through a standard web browser. At a glance, this JAVA utility shows the status of all components and combines the information found throughout the system. In addition, the Web interface includes complete management and configuration features.

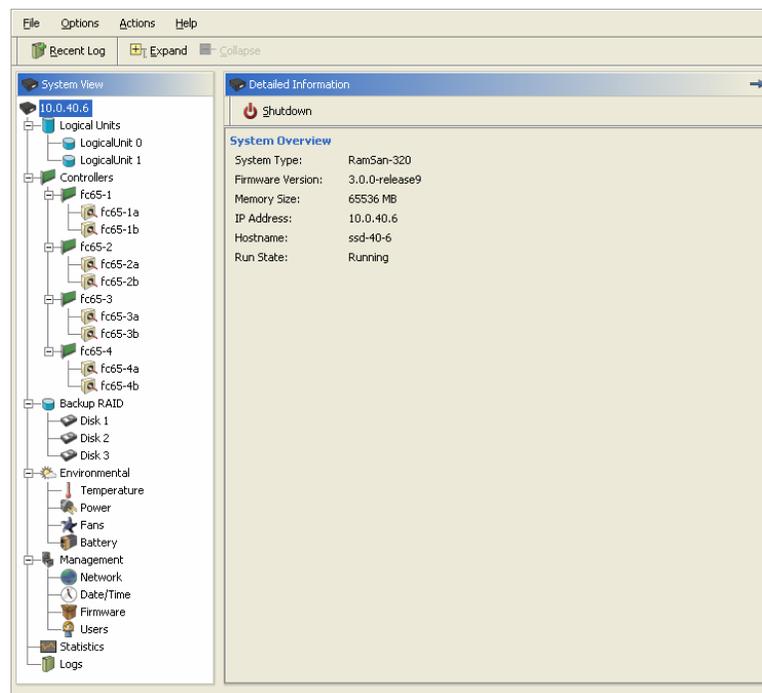


Figure 1: Web Management Interface

To access the web management interface, enter the RamSan's IP address in a web browser [http://000.000.000.000]. The web management interface is password protected. Enter your system login and password to access the web management interface.

Default username: admin

Default password: password

Texas Memory Systems designed the web management interface as a tree representing the actual system components. For detailed information, the user simply clicks on the component or expands the tree.

Chapter 2 – Web Interface

2.1 System Overview

2.1.1 Shutdown

The administrator can shut down the RamSan manually from WebMon. From the “**System Overview**” screen, click the “**Shutdown**” button. This procedure safely synchronizes all data in RAM to the internal hard disk drive storage before powering off the system.

Important:

TMS recommends backing-up the contents of the RamSan to your server or another storage device as a fail-safe before performing a Manual Shutdown.

To power on the RamSan after a manual shutdown, you will need physically press the black button on the rear of the RamSan adjacent to the power supplies.

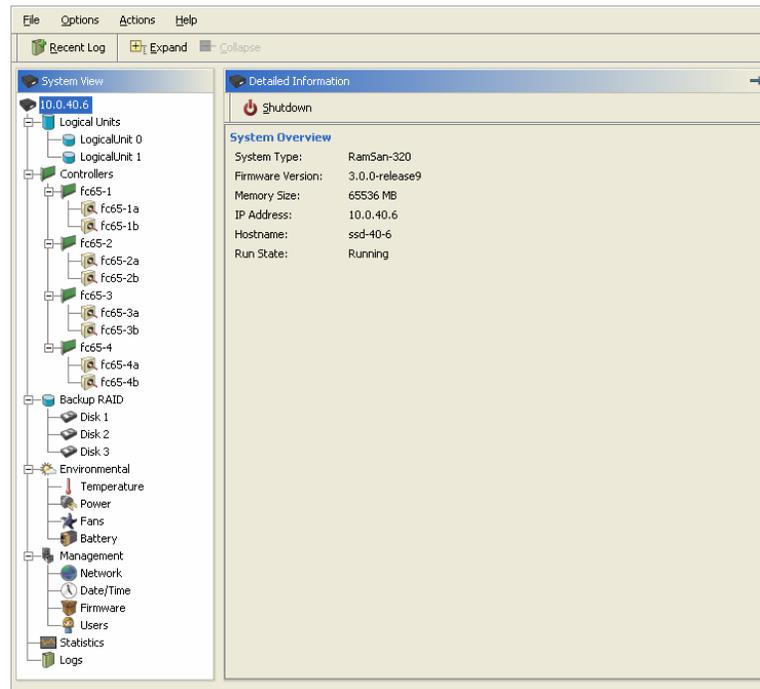


Figure 2: System Overview & Shutdown

2.1.2 Restart (available on some systems)

The administrator can restart the RamSan manually from WebMon. From the “**System Overview**” screen, click the “**Restart**” button. This

procedure safely synchronizes all data in RAM to the internal hard disk drive storage before powering off the system and then restarting.

Important:

TMS recommends backing-up the contents of the RamSan to your server or another storage device as a fail-safe before performing a Restart.

2.1.3 Recent Event Log

The Recent Event Log located at the bottom of the WebMon panel displays a listing of all system events. To display the Recent Event Log at any time, click the “Recent Log” button in the toolbar.

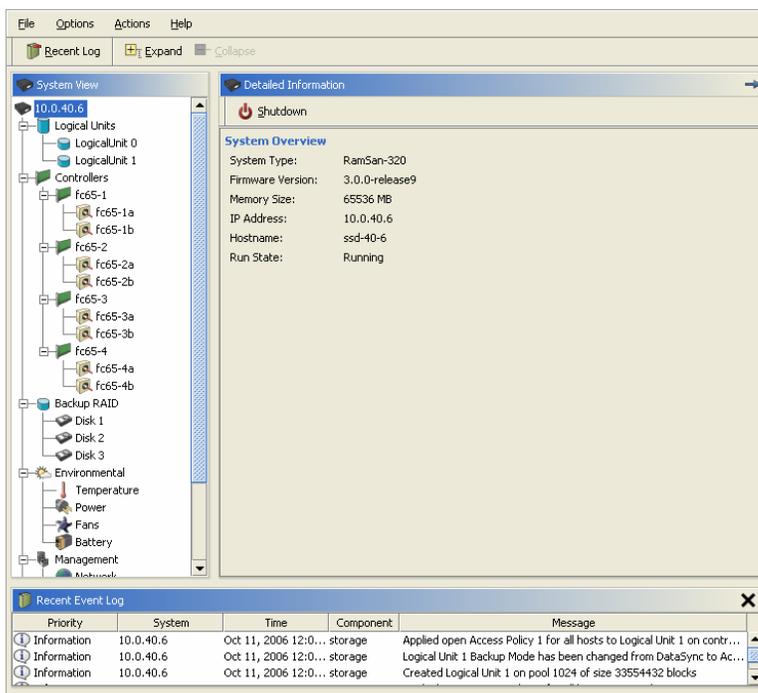


Figure 3: Recent Event Log

2.2 Logical Units

RamSan solid state disks support a variety of configurations and access control methods. LUN configuration is a memory-partitioning tool that allows the administrator to configure system memory into LUNs (Logical Unit Numbers) that may be assigned to specific Fibre Channel ports in the RamSan. In addition, the administrator can assign LUN specific backup modes and assign the LUNs' access lists, which mask the visibility to specific servers. The factory default configuration ships without LUNs configured, but using the web interface you can quickly arrange a variety of potential configurations.

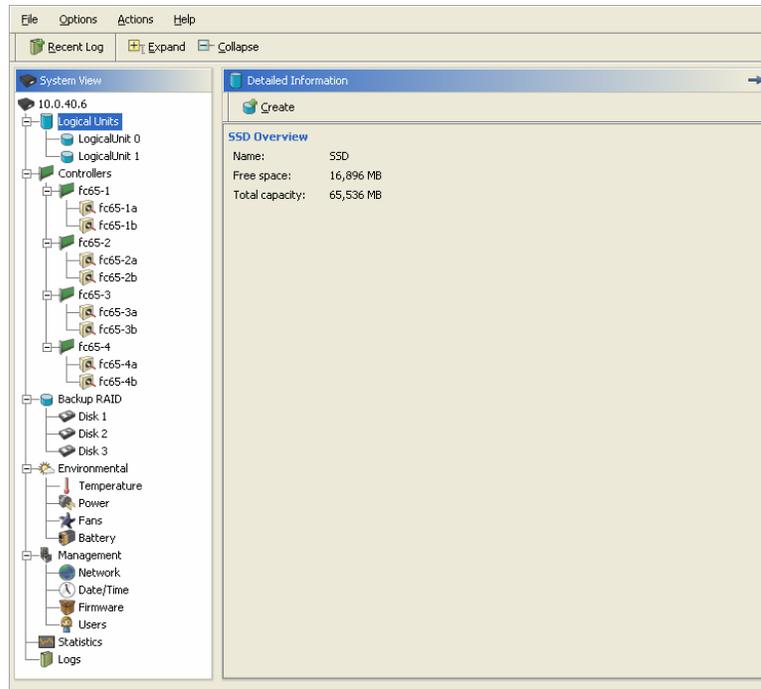


Figure 4: Logical Units Screen

2.2.1 Create LUN

The RamSan allows the administrator to add LUNs through the Web Management Interface. To create a new LUN from the available space, select the **“Logical Units”** link from the tree and click the **“Create...”** button. An intuitive wizard will guide you through the setup process.

The **“Name”** field enables you to give the LUN a memorable label. **“Number”** is the LUN number that is presented to the network, and **“Size”** represents the LUN’s capacity in MB.

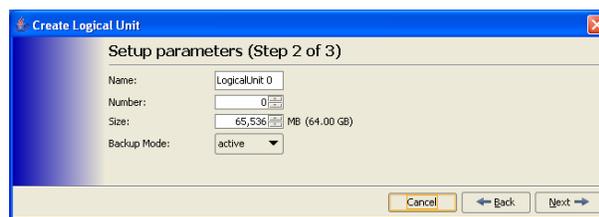


Figure 5: Create Logical Unit

“Backup Mode” corresponds to the method used to back up data to the RamSan’s internal hard disk drives. The RamSan allows the administrator to set backup modes for each LUN individually.

Warning:

Do not change backup modes while the system is actively transferring data.

Active Backup™ mode (optional)

This ideal mode for most users is only available from Texas Memory Systems. In Active Backup™ mode, the RamSan uses available internal bandwidth (i.e. performance not utilized by the applications) to constantly backup memory to the disks. The system automatically optimizes this operation to backup the maximum amount of data at any given time without impacting performance. This means that at any one time, most of the data already resides on disk. Upon emergency or shutdown, the unit need only finish the backup that is already nearly completed. Active Backup™ is an optional feature on the RamSan; therefore, some systems may not display this option.

DataSync mode

In DataSync mode, reads and writes are done only to memory. The disks remain offline during normal operation. If power loss occurs and the shutdown timer reaches zero, or the user requests a shutdown, the system takes the Fibre Channel interfaces offline and synchronizes all data to the internal hard drives.

Volatile mode (optional)

This operational mode disables the backup functionality for the LUN making it completely volatile. In the case of system shutdown or failure, all data stored in the selected LUN will be lost intentionally.

2.2.2 Access Control

The Web Management Interface provides the ability to create access lists for individual Fibre Channel ports. This allows the administrator to specify which worldwide port names (HBAs) are allowed to communicate with each partition. To make partitioned LUNs accessible to connected servers, the next step is to link the LUNs to the RamSan's Fibre Channel ports. This screen will appear automatically after creating a LUN or can be accessed by clicking the "**Access...**" button on the "**LUN details**" screen.



Figure 6: Updating Access Policies

Type in the HBA's WWN number to control access or leave the system in "**Open Access**" to allow any server on the SAN to access the LUN.

2.2.3 Modify LUN

The Web Management Interface makes it possible to change the LUN sizes. The configuration utilities allow you to both increase and decrease the size of the currently configured LUNs, to make room for more LUNs, or to ensure that the system is using all available space.

To modify the LUN's configurations settings, first select the LUN from the tree and then click the **"Modify..."** button. The standard LUN wizard will appear to edit LUN settings.

Warning:

Do not change backup modes while the system is actively transferring data.

2.2.4 Destroy LUN

The web interface allows the administrator to delete LUNs. Once the LUN is removed, it cannot be recovered. To remove a LUN, click the **"Destroy"** button and confirm that you want to delete the LUN.

2.3 Controllers

The RamSan allows the user to select the topology, link speed, and failover options for the Fibre Channel Controllers. RamSan supports Point-to-Point and Arbitrated loop topologies and can auto-detect the topology. The FC-400 supports 2- and 4-Gbit link speeds and can auto-detect the speed. The following two sections provide additional details.

The initial **"Controllers"** screen displays a listing of all Fibre Channel controller ports and their status. To get additional details, select the controller or its individual port.

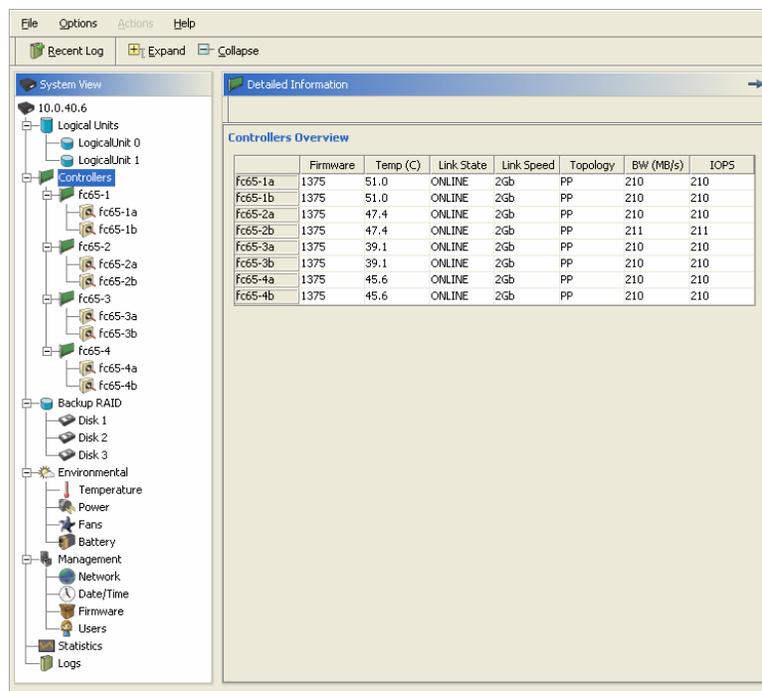


Figure 7: Controllers

2.3.1 Configure

To change the overall configuration of a Fibre Channel Controller, click the “**Config...**” button. The resulting “**Fibre Channel Controller Configuration**” screen enables the user to configure the Fibre Channel controller’s Log Level and Scrubbing functionality. Use the Log Level feature to set a minimum threshold for errors that are posted in the log. This is useful in some operating systems, such as AIX and HPUX, which generate frequent Fibre Channel link up and link down instances that can fill up the RamSan’s Event Log quickly.

The Fibre Channel Reset resets the Fibre Channel controller to power on state. Resetting the Fibre Channel card is only used if the entire Fibre Channel card becomes unresponsive.

Important:

Do not change the controller settings while the controller is actually transferring data. Saving changes causes the system to reset the Fibre Channel Controller, which may result in data corruption.

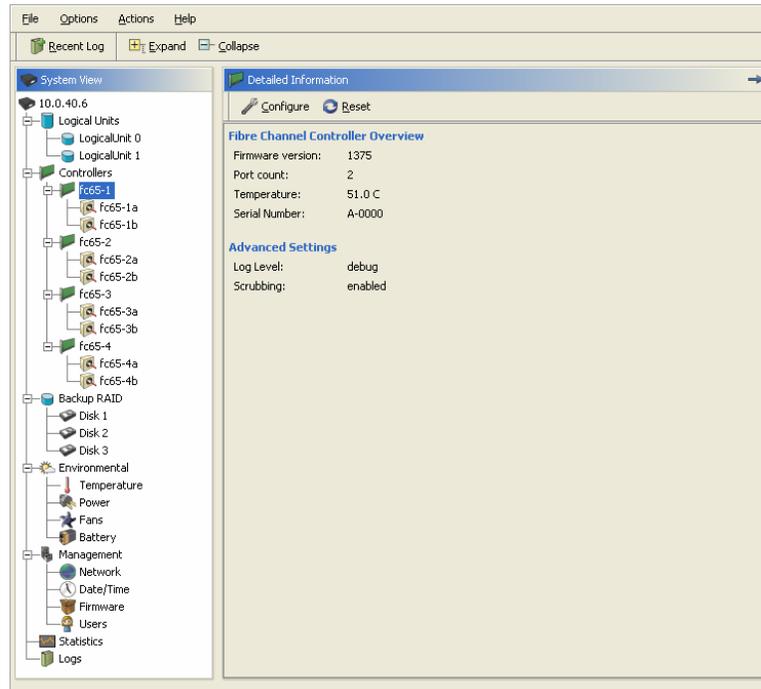


Figure 8: Fibre Channel Configuration

Note:

Some HBAs do not support direct attach point-to-point operation. If you are having trouble with a direct attach connection in point-to-point mode, try changing the controller to arbitrated loop mode. This topology should not affect performance noticeably, and some HBAs may only support this mode.

2.3.2 Ports

Each of the Fibre Channel's ports is configured independently. You can set the speed and topology of each port.

Configuration

The **"Speed"** selection configures the speed initialization for a Fibre Channel controller. You may select **"Auto"**, which indicates the Fibre Channel controller should automatically negotiate its speed, or you can select a specific FC-400 link speed at 2- and 4-Gb speeds.

Use the **"Topology"** selection to configure the topology initialization for a Fibre Channel controller. **"Auto"** indicates the Fibre Channel controller should automatically negotiate its topology. **"PP"** indicates point-to-point topology and **"AL"** indicates arbitrated loop topology.

The **"Loop ID"** selection is used to set the arbitrated loop ID for a Fibre Channel port. This is useful for some situations where the setup requires a defined loop ID. Usually a value of **"Soft"** is sufficient, as this means the number will be assigned automatically.

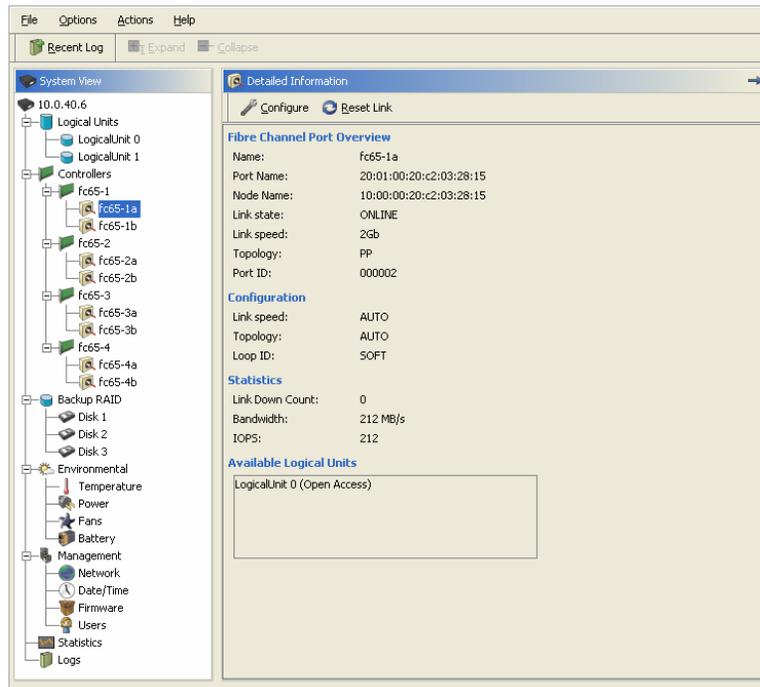


Figure 9: Fibre Channel Port Overview

Reset Link

The system allows you to reset a Fibre Channel port in the unlikely situation that a Fibre Channel port becomes unresponsive.

2.4 Backup RAID

2.4.1 View Disk Information

If a single hard disk drive fails, the system continues to write to the available hard disk drives. When this occurs, replace the malfunctioning disk with a new hard disk drive. Once inserted, the system synchronizes the new disk.

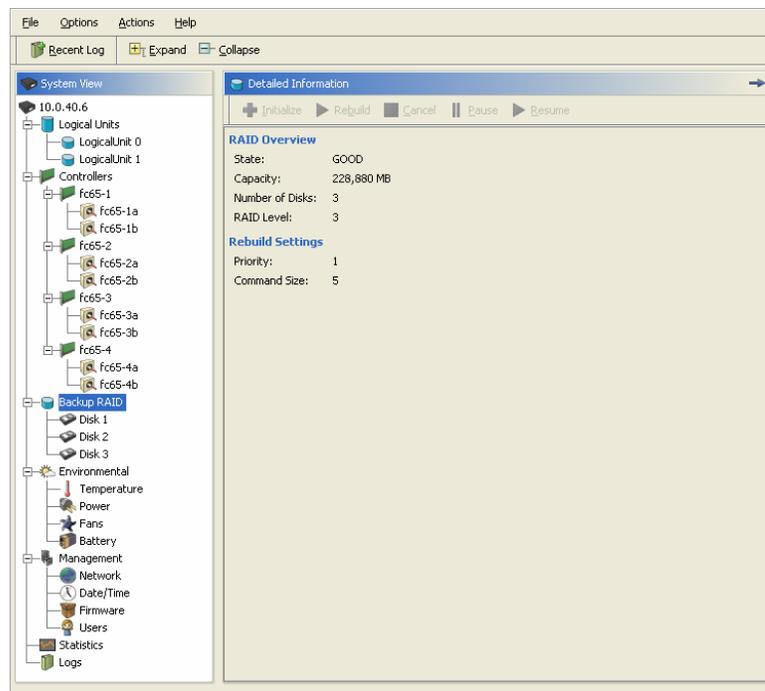


Figure 10: RAID Overview Screen

If all hard disks fail, the system automatically detects this and stays operational; however, the system remains volatile until all hard drives are functioning properly. When the new drives are replaced, the system rebuilds the drives from the system memory image.

2.5 Environmental

The Environmental section of the Web Management Interface enables administrators to view status of the individual system components, including temperature, and power.

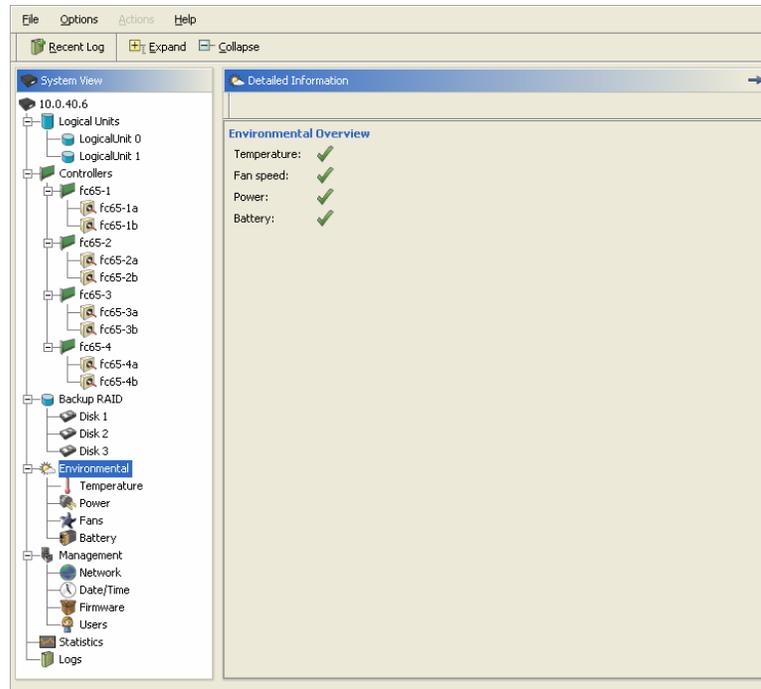


Figure 11: Environmental Overview

2.5.1 Temperature

Each board within the RamSan has a temperature sensor. The **“Temperature”** screen displays the temperature value of each sensor within the system.

2.5.2 Power

The system contains multiple sensors to measure voltage and amps. The **“Power”** screen displays the values of each sensor within the system.

Important:

Replace failed power supplies as soon as possible.

2.5.3 Fans

Each airflow channel has redundant fans so that cooling is sufficient as long as one of the two fans is running. If one fan fails, the system will issue a warning. If both fans in a single channel fail, the system will issue an error.

2.5.4 Battery

Schedule Test

The RamSan performs a periodic battery test to ensure the internal batteries are healthy. As scheduled, the system runs a test that exercises the batteries to ensure they are present and able to hold charge. There is

no risk for data loss during this test because the power supplies back up the batteries. The system repeats the test every 30 days. If the system powers off, the test cycle resumes as scheduled. The RamSan reports periodic battery test failures in the Event Log and in all of the management utilities, including the front panel display. If a failure occurs, contact Texas Memory Systems for a replacement battery immediately.

Important:

The periodic battery test does not guarantee that your batteries will have enough capacity to backup in all cases. Texas Memory Systems recommends replacing your batteries every two years, even if they continue to pass the periodic battery test.

2.6 Management

The Management section of the Web Management Interface enables administrators to change network settings, update the system date and time, upload firmware patches, and manage system users.

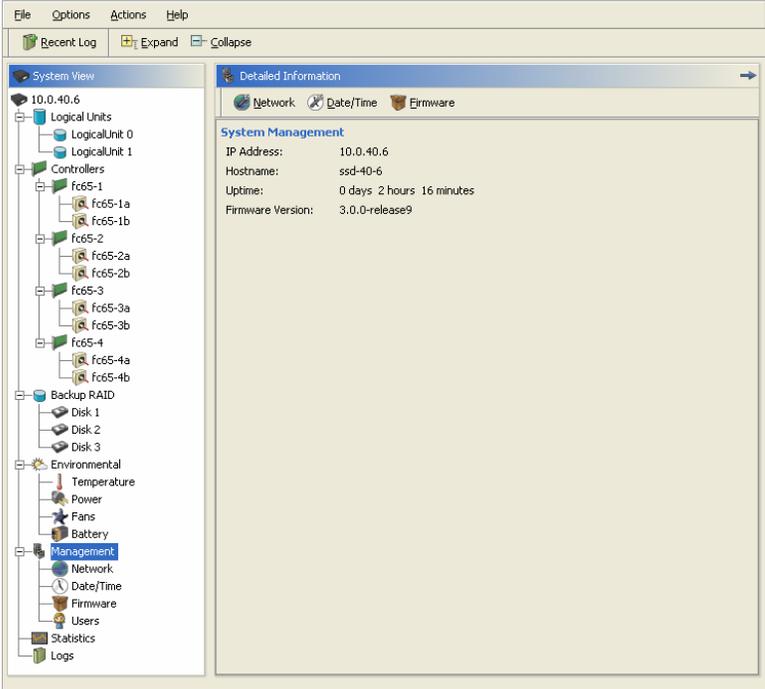


Figure 12: System Management

2.6.1 Network

The RamSan allows system monitoring and configuration through the serial port and the Ethernet port. To access the system's Ethernet port, the administrator must assign the RamSan an IP address, subnet mask, and possibly a gateway. The administrator may assign the IP address in one of three ways: Static IP, DHCP, or No Ethernet. The default factory setting is DHCP.

To change the network configuration, select “**Network**” from the tree and click the “**Edit Configuration**” button.

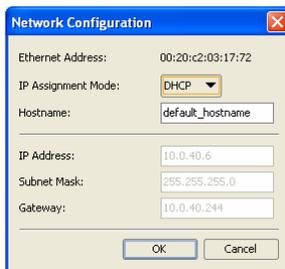


Figure 13: Network Configuration

For any questions regarding IP assignment values, please consult your network administrator.

2.6.2 Date/Time

The RamSan uses the system date and time to update the event log. This feature aids in troubleshooting. To change the system date or time, select “**Date/Time**” from the tree and click the “**Edit Date/Time**” button.

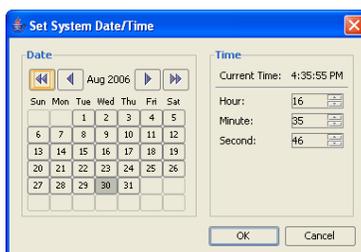


Figure 14: Updating Date/Time

2.6.3 Firmware

Occasionally, Texas Memory Systems releases new versions of firmware for the RamSan. To update your firmware, select “**Firmware**” from the tree and click the “**Update firmware**” button. From the “**Select patch file**” dialog box, click the “**Select...**” button and choose your patch file to upload. Once the firmware patch has completed, you will need to restart the system for a firmware patch.

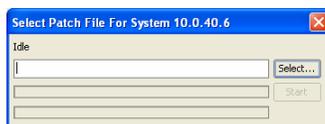


Figure 15: Updating Firmware Dialog

Important:

Before patching your RamSan, please review the README file associated with the patch. It contains detailed information about the functionality

updated, system downtime required for patching and recommended backup procedures.

2.6.4 Users

The user table is a representation of all the users that can log in to the system. Each user has a name, a password, and a group level.

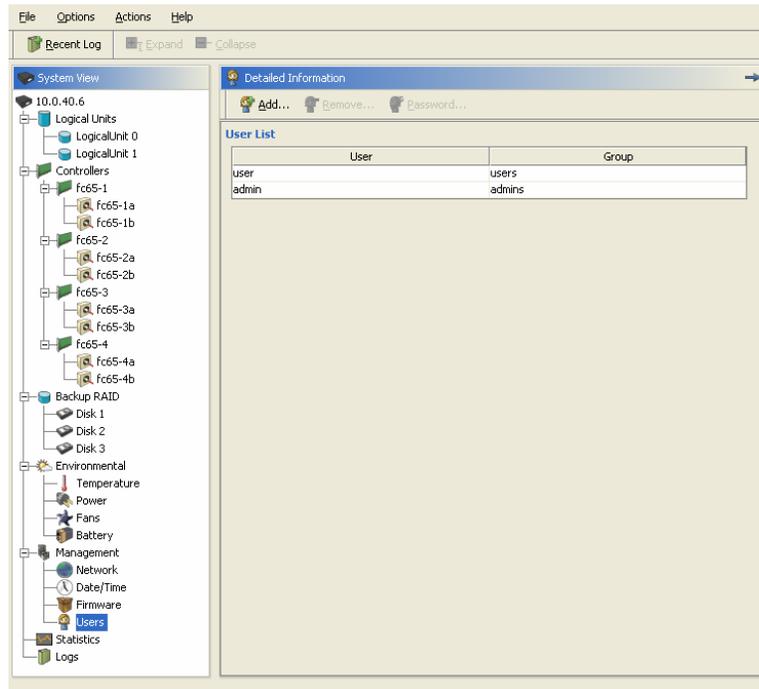


Figure 16: Viewing User Accounts

Add

To add a user, select **“Users”** from the tree, and then click the **“Add...”** button. A dialog box will instruct you to enter a new username, group and password. The system has two group levels: user and admin.

User level accounts are read only accounts. They are able to navigate to all areas of the system, but are unable to edit any setting. Admins are able to view and edit all functionality within the web interface.



Figure 17: Add Users

Password

Since it is possible to access the RamSan remotely through the management port, TMS includes a password feature for system security. The default password for the **“admin”** account is **“password”**

Logging in directly through the serial console automatically bypasses the password feature, which allows a system administrator access to the RamSan if the password is forgotten or lost.

2.7 Statistics

The storage administrator can monitor important statistics that define the level of system performance through the various management utilities. These statistics include Input and Output operations per second (IOPS) and bandwidth.

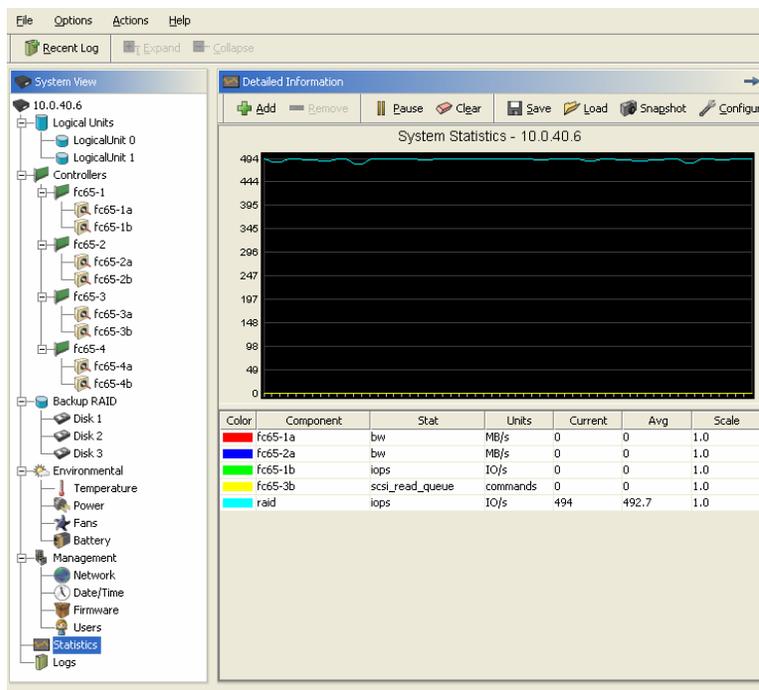


Figure 18: Statistics

The graphing tool provides the option to view read, write, and total IOPS, as well as a running average of each of these statistics. To decode the colors on the graphical display, view the legend below the check boxes.

The graphing tool provides the option to view read, write, and total bandwidth, as well as a running average of each of these statistics. To decode the colors on the graphical display, see the legend below the check boxes.

2.7.1 Editing the Statistics

To add statistics to the Statistics graph, select “**Statistics**” from the tree and click the “**Add**” button. A multi-select interface enables you to select the items you wish to monitor.

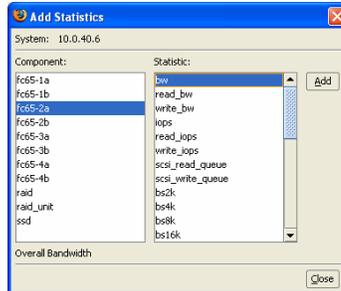


Figure 19: Adding Statistics

To remove statistics from the graph, use the **“Remove”** button. Statistics can also be saved and you can capture a snapshot of the current statistics as well.

2.8 Logs

The system provides two types of logs and a system report to aid in diagnosing system issues.

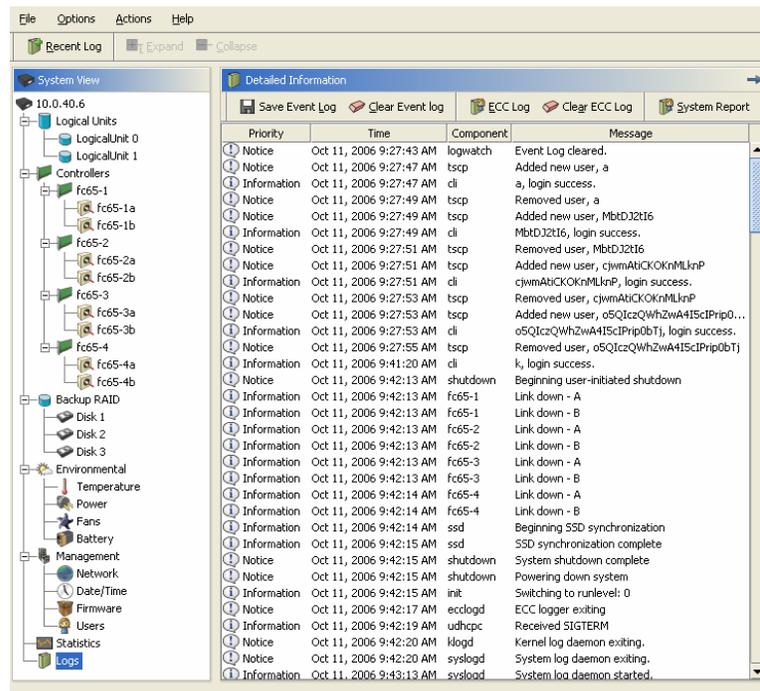


Figure 20: Viewing the Event Log

2.8.1 Event Log

In the case of a system failure, review the Event Log to determine what failed and when it failed. This information is invaluable in determining why a component failed and provides a timeline for the system administrator to follow.

2.8.2 ECC Log

The ECC log documents all ECC errors captured and reported within the system.

2.8.3 System Report

The System Report provides a snapshot of all current configuration settings. Before contacting Texas Memory Systems, please have a copy of this log available.